



Micro-mineral profile in different grassland species



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Introduction

The aim was to examine, if a range of grassland species on organic dairy farms could help to balance the micro mineral status of the diet.

Methods

Plot experiment in 2007-2008 with seven mixtures composed of one grass and one legume. The herbage was separated into species at harvest and analysed.

Legumes:

White clover – **WC**

Red clover – **RC**

Lucerne – **LU**

Birds-foot trefoil – **LO**

Grasses:

Perennial ryegrass - **PR**

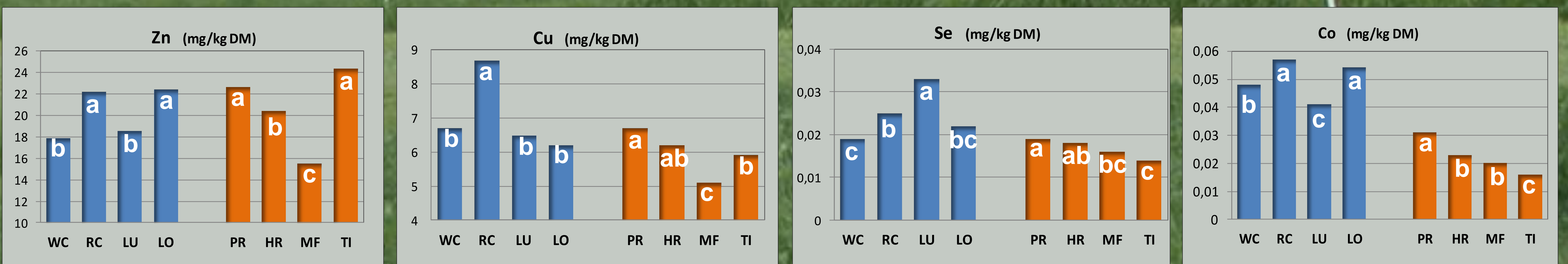
Hybrid ryegrass – **HR**

Meadow fescue - **MF**

Timothy - **TI**

Results – effects of species. Mean mineral concentration in the single species.

The species had different contents and profiles. The legumes as a group had compared to the grasses significantly higher concentration of Cu, Se, Co and lower concentration of Mn and Fe.



Results – effects of time in season and herbage mass

Concentrations of minerals (mg/kg DM) and DM-yield (t DM/ha) during spring and summer growth. Mean of all species.

		Co	Se	Mn	Cu	Zn	Fe	DM-yield
May	One week before	0.030	0.019	48.7	5.73 ^a	20.7 ^a	73.2 ^a	2.5 ^c
	Cut	0.030	0.018	50.1	5.23 ^b	19.0 ^b	64.0 ^b	3.3 ^b
	One week after	0.030	0.018	48.7	4.60 ^c	17.5 ^c	56.9 ^c	4.4 ^a
August	One week before	0.045	0.023	53.0	8.11 ^a	22.9 ^a	95.5	2.5 ^c
	Cut	0.044	0.022	52.7	7.82 ^{ab}	22.2 ^a	89.6	2.9 ^b
	One week after	0.040	0.022	52.3	7.49 ^b	20.7 ^b	84.4	3.5 ^a
Dairy cow requirement (NRC,2001)								
Dietary content		0.11	0.3	14	11	48	15	

Content of Cu, Zn and Fe decreased during the growth. However the decrease was particularly smaller than the differences between the species. The content of all minerals were higher in summer than in spring, and for Se, Cu and Fe this differences had a significant effect on the concentration level.

Conclusion:

Overall, the red clover/perennial ryegrass mixture had the highest concentrations of Co, Cu, Zn and Se and at the same time low concentrations of Mn and Fe. This mixture is therefore concluded to have the best micro-mineral profile in this experiment in relation to the recommended profile and level for dairy cow feeding.

The species had a higher effect on the micro minerals than the harvest time. Summer growth had a significant higher concentration than spring growth.